1. A method of operating a processing system to classify a feature in time series data, the method comprising:

    processing the time series data with a membership function to generate a hypersurface;

    processing the hypersurface to identify a cluster; and

5   processing the cluster to classify the feature.

2. The method of claim 1 wherein processing the hypersurface to identify the cluster comprises contouring the hypersurface to form the cluster.

10   3. The method of claim 1 wherein processing the cluster to classify the feature comprises classifying the cluster based on a cluster type.

4. The method of claim 3 wherein the cluster type comprises an atmospheric cluster type.

15   5. The method of claim 3 wherein the cluster type comprises a failure mode cluster type.

6. The method of claim 1 further comprising calculating feature membership values for the time series data based on the classified feature.

20   7. The method of claim 6 further comprising detecting outliers in the time series data based the feature membership values.

8. The method of claim 1 wherein the hypersurface has a height scale from zero to one.

9. The method of claim 1 wherein the hypersurface indicates confidence values for the time series data.

10. A method of operating a processing system to classify a feature in time series data, the method comprising:

processing the time series data with a plurality of membership functions to generate a plurality of hypersurfaces;

processing the hypersurfaces data to generate a composite hypersurface;

processing the composite hypersurface to identify clusters; and

processing the clusters to classify the feature.

11. The method of claim 10 wherein processing the composite hypersurface to identify the clusters comprises contouring the composite hypersurface to form the clusters.

12. The method of claim 10 wherein processing the clusters to classify the feature comprises classifying the clusters based on a plurality of cluster types.

13. The method of claim 12 wherein the cluster types include an atmospheric cluster type.

14. The method of claim 12 wherein the cluster types include a failure mode cluster type.

15. The method of claim 12 wherein processing the clusters to classify the feature comprises constructing the feature from the clusters based on the cluster classifications.

16. The method of claim 10 further comprising calculating feature membership values for the time series data based on the classified feature

17. The method of claim 16 further comprising detecting outliers in the time series data based the feature membership values.

5   18. The method of claim 10 wherein the composite hypersurface has a height scale from zero to one.

19. The method of claim 10 wherein one of the hypersurfaces indicates confidence values for the time series data.

10   20. The method of claim 10 further comprising processing one of the hypersurfaces to identify additional ones of the clusters.

21. A system to classify a feature in time series data, the system comprising:

an interface configured to receive the time series data; and

a processing system configured to process the time series data with a membership

function to generate a hypersurface, process the hypersurface to identify a cluster, and process

5   the cluster to classify the feature.

22. The system of claim 21 wherein the processing system is configured to contour the

hypersurface to form the cluster.

10   23. The system of claim 21 wherein the processing system is configured to classify the cluster

based on a cluster type.

24. The system of claim 23 wherein the cluster type comprises an atmospheric cluster type.

15   25. The system of claim 23 wherein the cluster type comprises a failure mode cluster type.

26. The system of claim 21 wherein the processing system is configured to calculate feature

membership values for the time series data based on the classified feature.

20   27. The system of claim 26 wherein the processing system is configured to detect outliers in the

time series data based the feature membership values.

28. The system of claim 21 wherein the hypersurface has a height scale from zero to one.

29. The system of claim 21 wherein the hypersurface indicates confidence values for the time series data.

30. A system to classify a feature in time series data, the system comprising:

an interface configured to receive the time series data; and

a processing system configured to process the time series data with a plurality of

membership functions to generate a plurality of hypersurfaces, process the hypersurfaces to

generate a composite hypersurface, process the composite hypersurface to identify clusters, and

process the clusters to classify the feature.

31. The system of claim 30 wherein the processing system is configured to contour the

composite hypersurface to form the clusters.

32. The system of claim 30 wherein the processing system is configured to classify the clusters

based on a plurality of cluster types.

33. The system of claim 32 wherein the cluster types include an atmospheric cluster type.

34. The system of claim 32 wherein the cluster types include a failure mode cluster type.

35. The system of claim 32 wherein the processing system is configured to construct the feature

from the clusters based on the cluster classifications.

36. The system of claim 30 wherein the processing system is configured to calculate feature

membership values for the time series data based on the classified feature

37. The system of claim 36 wherein the processing system is configured to detect outliers in the time series data based the feature membership values.

38. The system of claim 30 wherein the composite hypersurface has a height scale from zero to one.

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39. The system of claim 30 wherein one of the hypersurfaces indicates confidence values for the time series data.

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40. The system of claim 30 wherein the processing system is configured to process one of the hypersurfaces to identify additional ones of the clusters.

41. A software product to classify a feature in time series data, the software product comprising:

    application software configured to direct a processing system to process the time series data with a membership function to generate a hypersurface, process the hypersurface to identify a cluster, and process the cluster to classify the feature; and

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    a storage system that stores the application software.

42. The software product of claim 41 wherein the application software is configured to direct the processing system to contour the hypersurface to form the cluster.

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43. The software product of claim 41 wherein the application software is configured to direct the processing system to classify the cluster based on a cluster type.

44. The software product of claim 43 wherein the cluster type comprises an atmospheric cluster type.

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45. The software product of claim 43 wherein the cluster type comprises a failure mode cluster type.

46. The software product of claim 41 wherein the application software is configured to direct the

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processing system to calculate feature membership values for the time series data based on the classified feature.

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47. The software product of claim 46 wherein the application software is configured to direct the processing system to detect outliers in the time series data based the feature membership values.

48. The software product of claim 41 wherein the hypersurface has a height scale from zero to

5   one.

49. The software product of claim 41 wherein the hypersurface indicates confidence values for the time series data.

50. A software product to classify a feature in time series data, the software product comprising:

    application software configured to direct a processing system to process the time series data with a plurality of membership functions to generate a plurality of hypersurfaces, process the hypersurfaces data to generate a composite hypersurface, process the composite hypersurface to identify clusters, and process the clusters to classify the feature.

15   a storage system that stores the application software.

51. The software product of claim 50 wherein the application software is configured to direct the processing system to contour the composite hypersurface to form the clusters.

20   52. The system of claim 50 wherein the application software is configured to direct the processing system to classify the clusters based on a plurality of cluster types.

53. The system of claim 52 wherein the cluster types include an atmospheric cluster type.

54. The system of claim 52 wherein the cluster types include a failure mode cluster type.

55. The system of claim 52 wherein the application software is configured to direct the

5   processing system to construct the feature from the clusters based on the cluster classifications.

56. The system of claim 50 wherein the application software is configured to direct the

processing system to calculate feature membership values for the time series data based on the

classified feature

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57. The software product of claim 56 wherein the application software is configured to direct the

processing system to detect outliers in the time series data based the feature membership values.

58. The system of claim 50 wherein the composite hypersurface has a height scale from zero to

15   one.

59. The system of claim 50 wherein one of the hypersurfaces indicates confidence values for the

time series data.

20   60. The system of claim 50 wherein the application software is configured to direct the

processing system to process one of the hypersurfaces to identify additional ones of the clusters.

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